

A new genus and species of Sphaeriusidae (Coleoptera, Myxophaga) from Lower Cretaceous Burmese amber

Alexander G. KIREJTSHUK

Abstract: In the present work, *Burmasporum rossi* gen. et sp.nov. from Lower Cretaceous Burmese amber is described. It is the first fossil representative of the family Sphaeriusidae.

Key words: Burmese amber, Lower Cretaceous, Myxophaga, Sphaeriusidae.

Santrauka: Šiame darbe aprašomas *Burmasporum rossi* gen. et sp.nov. remiantis apatinės kreidos Myanmaro gintaru. Tai pirma Sphaeriusidae šeimos fosilinė rūšis.

Raktiniai žodžiai: Myanmaro gintaras, apatinė kreida, Myxophaga, Sphaeriusidae.

Introduction

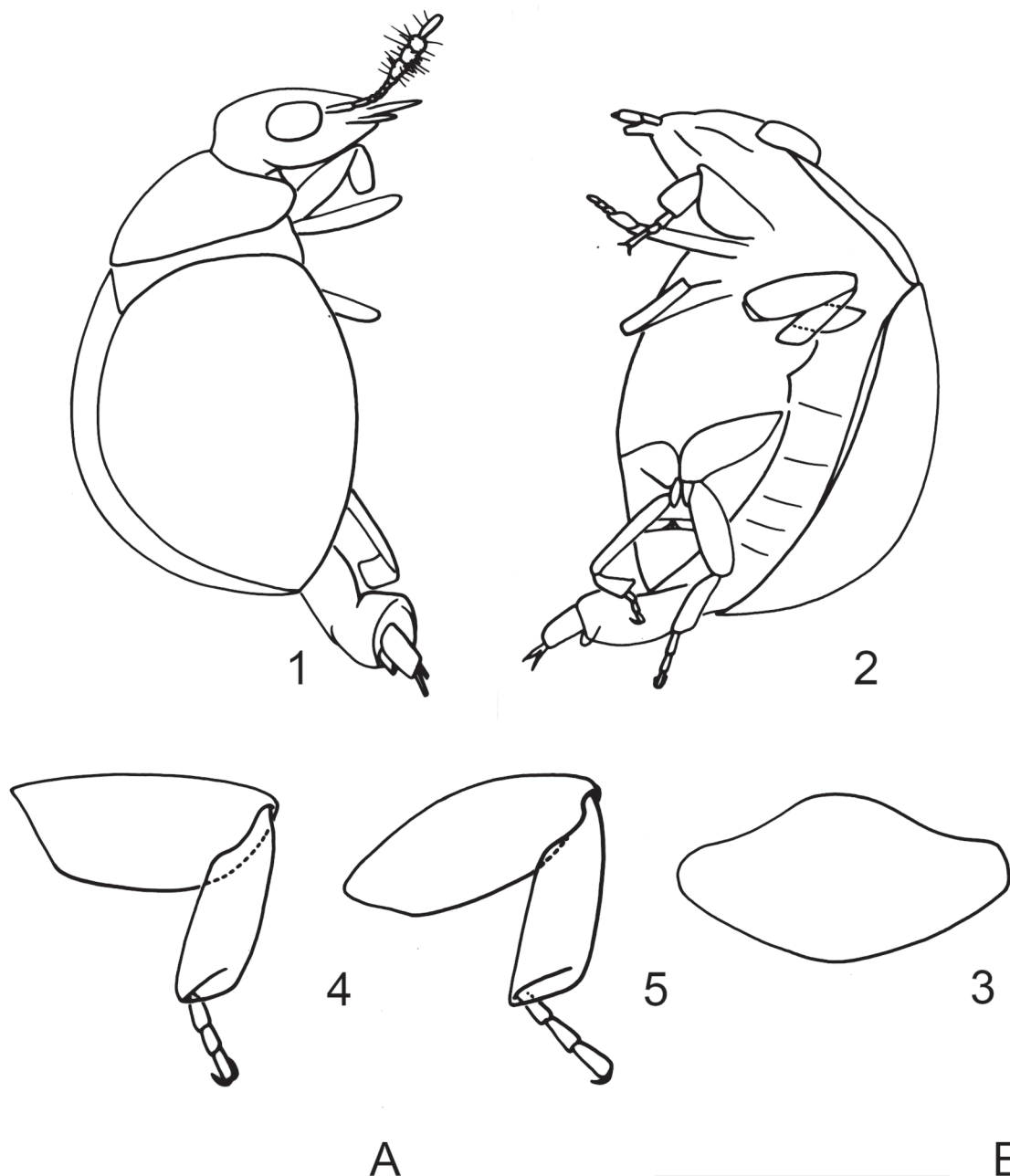
The suborder Myxophaga is poorly known in fossils. The species is the first fossil one of the family Sphaeriusidae ERICHSON, 1845 (= Microsporidae CROTCH, 1873), although the family was mentioned in the list of inclusions in Burmese amber deposited in the Natural History Museum in London (RASNITZIN & ROSS 2000). The Myxophaga includes few families, each with a small number of Recent species. It is divided into the superfamilies Microsporoidea CROTCH, 1873 and Lepiceroidea HINTON, 1936. The first fossil Myxophaga, *Haplochelus georissoides*, was described by KIREJTSHUK & POINAR (2006) also from Burmese amber as a member of the palaeoendemic family Haplochelidae KIREJTSHUK & POINAR, 2006 (Lepiceroidea). The species here described is the second Mesozoic representative of the suborder. More detailed information on this suborder in the fossil record can be obtained from the catalogue by PONOMARENKO & KIREJTSHUK (2008a). Nevertheless, this suborder is usually considered as a comparatively archaic group of the order. This viewpoint is supported by one fossil from the Lower Triassic Untuun location (PONOMARENKO & KIREJTSHUK 2008b). It has a small body size, as Recent members of the suborder, and is somewhat reminiscent of modern Hydroscaphidae species. The new genus here described is represented by the only species and, therefore, descriptions of it would considerably overlap with the description of species ("descriptio generica specifica").

Amber from Burma (Myanmar) occurs in lignitic seams in sandstone-limestone deposits in the Hukawng Valley. Palynomorphs obtained from the amber beds where the fossil piece originated have been assigned to the upper Albian (~110-100 Ma) (CRUICKSHANK & KO 2003). Nuclear magnetic resonance (NMR) spectra of amber samples taken from the same locality as the fossil indicated an araucarian (possibly *Agathis*) plant source (KIREJTSHUK & POINAR 2006).

Material and methods

The material under consideration is deposited in the Natural History Museum in London. For study the usual optic equipment was used, in particular the stereomicroscope Leica MZ 16.0 in the Zoological Institute of Russian Academy of Sciences, St. Petersburg.

Figs 1-5:
Burmasporum rossi
 gen. et sp.nov.,
 holotype: **1** – body,
 laterodorsal; **2** – ibid.,
 lateroventral; **3** –
 pronotum, dorsal; **4** –
 anterior legs, ventral;
5 – intermediate leg,
 ventral.
 Scales: A = 0.46 mm
 (Figs 1-3); B = 0.23
 mm (Figs 2-5).



Suborder Myxophaga CROWSON, 1955
Family Sphaeriusidae ERICHSON, 1845
Genus *Burmasporum* gen.nov.

Type species: *Burmasporum rossi* sp.nov.

Diagnosis: The new genus differs from the Recent representatives of the genus *Sphaerius* WALTZ, 1838 (= *Microsporum* KOLENATI, 1846) in the following peculiarities:

- comparatively larger, longer and more projecting head with longer anterior part of frons and longer mouthparts (particularly mandibles), and distinctly elongate eyes (not transverse as in species of *Sphaerius*);

- elongate scape and antennomere 2 (not widened as in species of *Sphaerius*), small antennomere 3 (not elongate as in species of *Sphaerius*), 4-segmented loose antennal club;
- movable pronotum with shorter lateral parts and widely rounded anterior and posterior angles;
- larger pronotum;
- metacoxae not reaching posterior edge of ventrite 1;
- comparatively long legs;
- more parallel-sided tibiae.

***Burmasporum rossi* sp.nov. (Figs 1-6)**

Holotype: "19132" (♀). The clear complete beetle is included in a large and irregular amber plate of homogeneous consistence and dark colour, together with other

insects, many gas vesicles, and some organic matter of different origin, particularly somewhat similar to "stellate hairs" in Baltic amber. The beetle holotype lies at an angle to the plane of the amber piece. The are also the holotype of *Burmitembia venosa* COCKERELL, 1919 (Isoptera, Embiidae), the holotype of *Mantoblatta mira* GOROCHOV, 2006 (Polyneoptera, Mantoblattidae), and a tick named as "Arachnida, Araneida, Acarida".

Description: Holotype (♀): length 0.8 mm, width 0.5 mm, height 0.4 mm. Oval, rather convex dorsally and slightly so ventrally; unicoloured dark brown to blackish; shining; without clear puncturation and smoothed integument; glabrous.

Head rather large and subflattened, seemingly somewhat longer than distance between eyes, which are well developed, somewhat elongate and consisting of extremely small facets. Labrum seemingly somewhat exposed from under frons. Mandibles very long and visible only laterally. Maxillary palpi visible only laterally, almost reaching mandibular apices and last palpomere, more than twice as long as wide. Antennae 11-segmented, with elongate scape (about 4 times as long as wide at apex) and antennomere 2 (about twice as long as wide at apex), antennomeres 3-7 subtransverse and small, club loose 4-segmented (antennomeres 8 elongate, antennomere 9 subquadrate, antennomere 10 subtransverse, terminal antennomere more than twice as long as wide and about as wide as antennomeres 3-7). Pronotum evenly convex and seemingly more than twice as wide as long, longest along the middle, and lateral sides about 1/3 as long as along median line, anterior and posterior edges gently convex. Scutellum subtriangular and about 1/4 as wide as pronotum.

Ventral side of head obscurely visible with mentum seemingly transverse and about half as long as eye. Prosternum very short, in the middle about 1/4 as long as head, procoxae open posteriorly and seemingly not contiguous. Mesocoxae seemingly as separated as its width. Metaventricle subflattened with oblique and contiguous metacoxae. Metacoxae not reaching posterior edge of ventrite 1. Abdomen about half as long as metasternum. Hypopygidium subtriangular and with angular apex.

Legs moderately developed. Protibia slightly widened apically and about 2/3 as wide as antennal club; metatibia subparallel-sided and nearly half as wide as antennal club; mesotibia with large triangular expansion at apex; all tibiae with rows of dark brown bristles along outer edges and dense hairs through entire surface. Femora about twice as wide as metatibia or somewhat wider, with puncturation and covered with short bristles. Protarsus about as wide as corresponding tibia; meso- and metatarsi somewhat narrower; claws simple and slightly expanded at base.

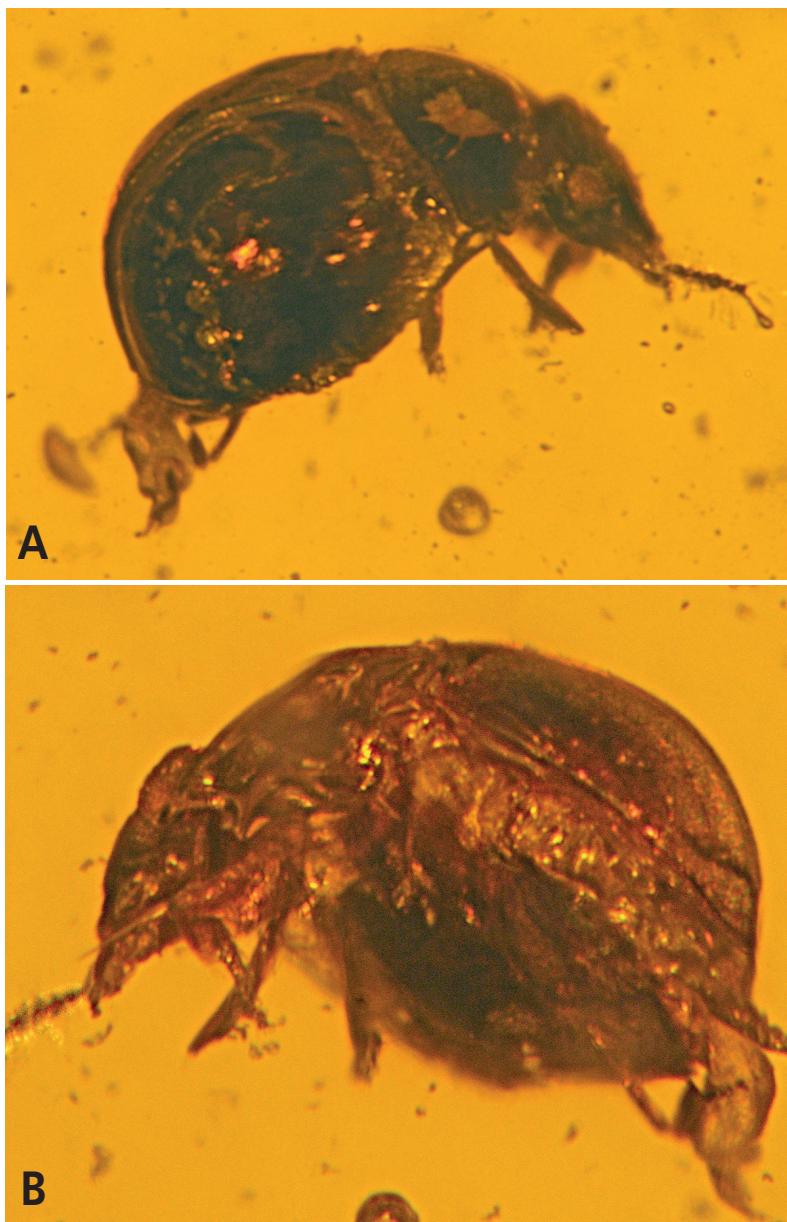


Fig. 6: *Burmasporum rossi* gen. et sp.nov.: **A** – body of holotype, laterodorsal; **B** – ibid., lateroventral.

Discussion

Burmasporum rossi gen. et sp.nov. shows a great similarity to the species of *Sphaerius*, which can be interpreted as an evidence that the family Sphaeriusidae became recognizable before the time of deposition of the Burmese amber. Most Recent representatives of this family are associated with moist substrates (usually they live at river banks), although ENDRÖDY-YOUNGA (1997) described an African species which lives in more or less dry ecological circumstances. The new fossil species could have inhabited the Cretaceous forest with Araucariaceae producing the Burmese amber.

Zusammenfassung

Als erster fossiler Vertreter der Familie Sphaeriusidae (Kugelkäfer) wird die neue Gattung und Art *Burmasporum rossi* gen. et sp.nov aus Burmesischem Bernstein (Unterkreide) beschrieben. Obwohl die Abspaltung der Familie nach diesem Befund mindestens in die früheste Mittelkreide zu legen ist, weist die neue Art große Ähnlichkeiten mit rezenten Arten der Gattung *Sphaerius* auf.

Acknowledgements

The author is indebted to A.J. ROSS for providing him with the specimen here described and to G. HODEBERT (Museum National d'Histoire Naturelle, Paris) for the realization of the drawings. The study was supported by the grants of Russian Foundation of Basic Research N 070400540a and 07-04-92105-GFENa, and also by the Programme of the Presidium of the Russian Academy of Sciences "Origin and Evolution of the Biosphere".

References

- CRUICKSHANK R.D. & K. KO (2003): Geology of an amber locality in the Hukawng Valley, northern Myanmar. — *J. Asian Earth Sci.* **21**: 441-445.
- ENDRÖDY-YOUNG S. (1997): Microsporidae (Coleoptera: Myxophaga), a new family for African continent. — *Ann. Transvaal Mus.* **36** (24): 313-332.
- KIREJTSHUK A.G. & G. POINAR (2006): Haplochelidae, a new family of Cretaceous beetles (Coleoptera, Myxophaga) from Burmese amber. — *Proc. Entomol. Soc. Washington* **108** (1): 155-164.
- PONOMARENKO A.G. & A.G. KIREJTSHUK (2008a): Taxonomic list of fossil beetles of suborders Cupedina, Carabina and Scarabaeina (Part 1). — <http://www.zin.ru/Animalia/Coleoptera/eng/paleosys2.htm> (August 2008).
- PONOMARENKO A.G. & A.G. KIREJTSHUK (2008b): Taxonomic list of fossil beetles of suborder Scarabaeina (Part 3). — <http://www.zin.ru/Animalia/Coleoptera/rus/paleoatl.htm> (August 2008).
- RASNITZIN A.P. & A.J. ROSS (2000): A preliminary list of arthropod families present in the Burmese amber collection at the Natural History Museum, London. — *Bull. Nat. Hist. Mus. London, Geol.* **56** (1): 21-24.

Address of author:

Alexander G. KIREJTSHUK
Zoological Institute
Russian Academy of Sciences
Universitetskaya emb., 1
St. Petersburg, 199034, Russia
E-Mail: agk@zin.ru,
alexander_kirejtshuk@yahoo.com,
ak3929@ak3929.spb.edu